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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,198	11/14/2001	Ken'ichi Kasazumi	10873.841US01	7022

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MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER

BATTAGLIA, MICHAEL V

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/993,198

Applicant(s)

KASAZUMI ET AL.

Examiner

Michael V Battaglia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2001.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,6 and 9 is/are rejected.
7) ☐ Claim(s) 2-5,7,8 and 10 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 14 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figure 14 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Henshaw et al (hereafter Henshaw) (US 5,319,629).

In regard to claim 1, Henshaw discloses a holographic optical information recording/reproducing device (Fig. 1) that, to reproduce digital data recorded in a form of interference fringes produced by two coherent beams in a recording medium (Col. 6, lines 58-66), projects a coherent beam to the recording medium and receives a reproduction signal beam obtained by diffraction at the recording medium by means of a two-dimensional photodetector array (Fig. 1, elements 134 and 144), the holographic optical information recording/reproducing device comprising: a tunable coherent light source that emits the coherent beam (Fig. 1, element 102 and Col. 6, lines 2-3) and a control section that reads a position information of the reproduction signal beam on the two-dimensional photodetector array, and controls a wavelength of the tunable coherent light source according to the position information (Col. 7, lines 47-52 and 59-62).

In regard to claim 6, Henshaw discloses a lens system (Fig. 1, elements 136, 140, and 142) for focusing diffracted light from the recording medium (Fig. 1, element 118) into the two-dimensional photodetector array (Fig. 1, elements 134 and 144), wherein the recording medium is disposed at a position different from a focus of the lens system (Fig. 1). The examiner interprets the focal point of the lens system to be on the photodetector array, which is disposed in a position different from the position of the recording medium.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Henshaw in view of Kitaoka et al (hereafter Kitaoka) (US 5,385,650).

Henshaw discloses the optical information recording/reproducing device of claim 1 that uses a tunable coherent light source that is a coherent light source (Col. 6, lines 2-3). Henshaw does not disclose that the tunable coherent light source is a coherent light source utilizing a tunable semiconductor laser and a second-harmonic generation element.

Kitaoka discloses utilizing a tunable semiconductor laser and a second-harmonic generation element as a coherent light source (Fig. 1B, elements 1 and 3 and Col. 14, lines 1-6). Kitaoka further discloses second-harmonic generation elements allow harmonics to be generated with high efficiency (Col. 1, lines 37-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a tunable semiconductor laser and a second-harmonic generation element in the tunable coherent light source of Henshaw as suggested by Kitaoka, the motivation being to generate harmonics with high efficiency.

Citation of Relevant Prior Art

7. Hays et al (US 5,777,760) discloses a holographic storage device that detects position deviation according to changes in a reproduced image detected by a two-dimensional photodetector array (Fig. 10). Bernal et al (US 6,281,993) discloses an element for imparting a two-dimensional phase distribution to the signal beam on a spatial light modulator, where the phase shifts have values of 0 or π , and teaches imparting a phase distribution reduces peak

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intensity light and improves the signal to noise ratio (Fig. 11A). Yamaji et al (US 6,088,321) discloses a holographic storage device having four photoreceptor cells for every data bit (Col. 7) and shows feedback information from a photodetector array that is used by a system controller (Fig. 1). Wilde (US 5,822,090) teaches that using tunable lasers in holographic storage device allow a myriad of enhanced system designs, reduce access latency, and improve sustained data transfer rates (Cols. 2 and 5). Henshaw et al (US 5,191,574) discloses a cylindrical lens used to direct each different wavelength to the proper vertical stripe to prevent crosstalk between the patterns stored in the holographic memory (Col. 9). Campbell et al (US 6,061,154) discloses a focusing system for a holographic memory. Heanue discloses a diffusing plate used to encrypt data from a spatial light modulator by adding phase delays of 0 or π (Cols. 3-4).

Allowable Subject Matter

8. Claims 2-5, 7-8, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regard to claim 2, none of the references of record alone or in combination disclose or suggest a holographic optical information recording/reproducing device that, to reproduce digital data recorded in a form of interference fringes produced by two coherent beams in a recording medium, projects a coherent beam to the recording medium and receives a reproduction signal beam obtained by diffraction at the recording medium by means of a two-dimensional photodetector array, the holographic optical information recording/reproducing device comprising: a tunable coherent light source that emits the coherent beam and a control section that reads a position information of the reproduction signal beam on the two-dimensional

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photodetector array, and controls a wavelength of the tunable coherent light source according to the position information; wherein at least one photoreceptor cell of the two-dimensional photodetector array is divided into not less than two regions, **at least a part of the reproduction signal beam is made incident on the regions of the divided photoreceptor cell so as to be used as a servo-use beam, and the control section detects the position information according to a differential signal derived from signals obtained at the respective regions by the servo-use beam.**

In regard to claim 3, none of the references of record alone or in combination disclose or suggest a holographic optical information recording/reproducing device that, to reproduce digital data recorded in a form of interference fringes produced by two coherent beams in a recording medium, projects a coherent beam to the recording medium and receives a reproduction signal beam obtained by diffraction at the recording medium by means of a two-dimensional photodetector array, the holographic optical information recording/reproducing device comprising: a tunable coherent light source that emits the coherent beam, a control section that reads a position information of the reproduction signal beam on the two-dimensional photodetector array, and controls a wavelength of the tunable coherent light source according to the position information, an anamorphic optical system through which the coherent beam passes, **wherein the control section detects a position deviation of the coherent beam in a focusing direction, and a wavelength deviation of the tunable coherent light source independently, according to changes in a reproduced image detected by the two-dimensional photodetector array.**

In regard to claim 4, none of the references of record alone or in combination disclose or suggest a holographic optical information recording/reproducing device that, to reproduce digital data recorded in a form of interference fringes produced by two coherent beams in a recording medium, projects a coherent beam to the recording medium and receives a reproduction signal

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beam obtained by diffraction at the recording medium by means of a two-dimensional photodetector array, the holographic optical information recording/reproducing device comprising: a tunable coherent light source that emits the coherent beam and a control section that reads a position information of the reproduction signal beam on the two-dimensional photodetector array, and controls a wavelength of the tunable coherent light source according to the position information, a beam splitter for dividing the coherent beam emitted from the tunable coherent light source into two beams that are a signal beam and a reference beam a spatial light modulator for modulating an intensity of the signal beam two-dimensionally an element for imparting a two-dimensional phase distribution to the signal beam on the spatial light modulator, **the element having a greater coherence length in its peripheral region than in its central region,** and an optical system for crossing the signal beam and the reference beam on the recording medium.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V Battaglia whose telephone number is (703) 305-4534. The examiner can normally be reached on 5-4/9 Plan with 1st Friday off.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael Battaglia


W. R. YOUNG
PRIMARY EXAMINER